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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/595,259	03/31/2006	Issey Yamamoto	36856.1395	6013
54066 7590 02/25/2008 MURATA MANUFACTURING COMPANY, LTD. C/O KEATING & BENNETT, LLP 8180 GREENSBORO DRIVE SUITE 850 MCLEAN, VA 22102				
EXAMINER PATEL, ISHWARBHAI B				
ART UNIT 2841		PAPER NUMBER		
NOTIFICATION DATE 02/25/2008		DELIVERY MODE ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

JKEATING@KBIPLAW.COM  
uspto@kbiplaw.com

### Office Action Summary

**Application No.**

10/595,259

**Applicant(s)**

YAMAMOTO ET AL.

**Examiner**

Ishwar (I. B.) Patel

**Art Unit**

2841

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 29 November 2007.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 16-31 is/are pending in the application.  
4a) Of the above claim(s) 20, 21, 23, 26-28 is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 16-19, 22, 24, 25 and 29-31 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 31 March 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 3/21.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application  
6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

1. Applicant's election without traverse of specie I, claims 16-19, 22, 24, 25, 29, 30 and 31 in the reply filed on November 29, 2007 is acknowledged.

### ***Priority***

2. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copy has been received and placed of record in the file.

### ***Specification***

3. The disclosure is objected to because of the following informalities: "Fig. 2A" should be - - 3A - -, paragraph (0028), brief description of figure 4.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 16-19, 22, 24, 25, 30 and 31 are rejected under 35 U.S.C. 102(b) as being anticipated by Asai (US Patent No. 6,534,723).

Regarding claim 16, Asai in figure 8 discloses an internal conductor connection structure comprising: an insulator substrate (80); line conductors disposed in the

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insulator substrate (traces on layer 70, 72, 74 see figure); and at least two via conductors adjacent each other (via conductor on the left side of figure 8) at a predetermined interval in the insulator substrate (see figure), at least one of the at least two via conductors including a continuous via conductor arranged to extend in a direction away from the other via conductor (via on the left of the figure); wherein the at least one of the at least two via conductors is connected to one of the line conductors through the continuous via conductor (via on the left is connected to the trace on layer 70).

Regarding claim 17, Asai further discloses a connecting portion of the line conductor to the continuous via conductor or a connecting portion of the continuous via conductor that is connected to the line conductor is arranged to be a connecting land having an area larger than the connecting portion of the other conductor (trace on layer 70 forming land is larger than the via conductor, see figure).

Regarding claim 18, Asai in figure 8 discloses a multilayer substrate comprising: a laminate (80) including a plurality of laminated insulator layers (70, 72, 74, 76); at least first and second via conductors (vias conductor, one on the left side, the other on the right side of figure 8) extending inside the laminate from positions adjacent to each other at a predetermined interval from a first main surface of the laminate (see figure); a first line conductor (traces on layer 70, see figure) connected to the first via conductor (connected via on the left side of the figure), the first via conductor including a first

continuous via conductor arranged to extend in a direction away from the second via conductor (see figure, the via on the left side of the figure); wherein the first via conductor is connected to the first line conductor through the first continuous via conductor (via on the left is connected to the trace on layer 70).

Regarding claim 19, Asai further discloses a third via conductor (second via conductor from the left of figure 8) extending inside the laminate from the first main surface of the laminate, the second via conductor (the via on the right side of the figure 8) includes a second continuous via conductor arranged to extend in a direction away from both the first and third via conductors (see figure), wherein the second via conductor is connected to a second line conductor (trace on layer 70, see figure) through the second continuous via conductor (see figure).

Regarding claim 22, Asai further discloses first continuous via conductor and the second continuous via conductor penetrate through their respective insulator layers (see figure).

Regarding claim 24, Asai further discloses a connecting portion of the first line conductor to the first continuous via conductor or a connecting portion of the first continuous via conductor to the first line conductor is arranged to be a connecting land larger than the connecting portion of the other conductor (trace on layer 70 forming land is larger than the via conductor, see figure).

Regarding claim 25, Asai further discloses a connecting portion of the second continuous via conductor that is connected to the second line conductor or a connecting portion of the second line conductor that is connected to the second continuous via conductor is arranged to be a connecting land that is larger than the connecting portion of the other conductor (trace on layer 70 forming land is larger than the via conductor, see figure).

Regarding claim 30, Asai further discloses each of the via conductors and the line conductors individually include an electrically conductive material containing silver or copper (via filled with copper, column 15, line 11-20).

Regarding claim 31, Asai further discloses the first continuous via conductor only partially overlaps with the first via conductor (see figure).

6. Claims 18 is rejected under 35 U.S.C. 102(b) as being anticipated by Arima (US Patent No. 5,375,042).

Regarding claim 18, Arima in figure 1 discloses a multilayer substrate comprising: a laminate (1) including a plurality of laminated insulator layers (ceramic insulating layer 11); at least first and second via conductors (vias conductor, on the left side of figure 8) extending inside the laminate from positions adjacent to each other at a predetermined interval from a first main surface of the laminate (see figure); a first line

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conductor (traces on layer 11 on one of the internal layer, see figure) connected to the first via conductor (connected to second via from the left side of the figure), the first via conductor including a first continuous via conductor arranged to extend in a direction away from the second via conductor (see figure, the second via from the left side of the figure); wherein the first via conductor is connected to the first line conductor through the first continuous via conductor (the second via from left is connected to the trace on one of the internal layer 11, see figure).

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Arima (US Patent No. 5,375,042) as applied to claim 18 above and further in view of Fukuta (US Patent No. 5,456,778).

Regarding claim 29, Arima discloses all the features of the claimed invention as applied to claim 18 above including the ceramic insulating layers, but does not explicitly disclose the ceramic layers are low temperature sinterable ceramic material. However, use of low temperature sinterable ceramic material, as disclosed by Fukuta (column 6, line 3-5) is old and known in the art for better via hole connection quality.

Therefore it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to provide the board of Arima with insulating material made of sinterable ceramic material, as taught by Fukuta, as is old and known in the art.

Further, it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960).

### ***Conclusion***

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Fazelpour (US Patent No. 6,812,576) in figure 4A discloses an interconnect structure with two via conductors adjacent each other at a predetermined interval including a continuous via conductor arranged to extend in a direction away from one of the via conductors.

Kondo (US Patent No. 6,855,625) discloses a circuit board with via holes formed in the shape of oblong circular shape (figure 4A-4B).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ishwar (I. B.) Patel whose telephone number is (571) 272 1933. The examiner can normally be reached on M-F (8:30 - 5:00).



If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego Gutierrez can be reached on (571) 272 2245. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

February 17, 2008

/Ishwar (I. B.) Patel/  
Primary Examiner, Art Unit 2841